

REMARKS

Specification

The name of the compound on page 1, line 31 has been corrected per the suggestion of the Examiner.

Status of the Claims

Claims 1-9 and 16-26 are pending in the present application. Applicant has cancelled claims 1-9, 16 and 18 without prejudice or disclaimer of the subject matter contained therein. The subject matter of claim 18 has been incorporated in amended claim 17. No new matter has been added.

Rejections Under 35 USC §112, second paragraph

The Examiner has rejected claims 1-9 and 16-26 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-9 and 16 have been cancelled. Claim 17 has been amended to insert the word "ester" after "2-butyl-2-ethyl-1,3-propanediol" as requested by the Examiner. Claim 17 has also been amended to stipulate that the polyol esters are prepared *in situ* (i.e. in the same vessel). With respect to the definition of the term "*in situ*", Applicant believes that the phrase is generally understood by persons of skill in the art to mean something that occurs in the same place. The Specification makes reference to the term on page 3 and the Example 4 (Preparation of Complex Esters of HPHP) on pages 9-10 of the Specification describes the preparation of the complex esters within "a glass reactor" (i.e. one vessel). Applicant, therefore, believes that the definition of the term "*in situ*" is evident from the disclosure and that amending the claim language is unnecessary. Reconsideration and removal of the rejections is respectfully requested.

Rejections Under 35 USC §102(b)

The Examiner has rejected claims 1-9 under 35 USC §102(b) as being anticipated by Nakahara et al. (US Pat. No. 5,374,366). Applicant has cancelled claims 1-9 rendering the rejection moot. Reconsideration and removal of the rejection is requested.

Rejections Under 35 U.S.C. §103(a)

Claims 1-9 and 16-26 have been rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Nakahara et al. The Examiner argues that Nakahara et al. discloses compositions comprising lubricating oils synthesized from esters combined with various polyols and linear and branched mono- and di-carboxylic acid, said oils mixed with fluorocarbon refrigerants. The Examiner further argues that nearly all of the glycols and carboxylic acids used in the present invention are disclosed in the Nakahara reference and that it would have been obvious to a skilled artisan that all of the mixed ester oils claimed in the instant invention fall within the disclosure of Nakahara et al. Applicant respectfully disagrees.

Applicant has amended claim 17 to state that the polyol ester is prepared *in situ*. The Examiner argues that Nakahara discloses a one-stage or a two-stage process at column 4, lines 50 et seq. However, since Component A is an ester, in practice the process will have at least two stages before the reaction referred to in column 4 at line 38 (one preliminary step for pre-esterification of the hydrocarboxylic acid.) By contrast, the present invention comprises a true *in situ* method in which all the components are mixed together and reacted. The benefits of using one vessel esterification were discussed in Applicant's previous response and are reproduced below:

“The non-obviousness of the present invention is evident from a comparison of the data presented in Tables 3 and 4 of the Specification on

pages 10-11. Sample 4 of Table 3 shows that complex esters of HPHP with octanoic acid and adipic acid, in a 80:20 molar ratio, have a pour point of -51°C. There is, however, a distinct lowering of the pour point when HPHP is mixed with another polyol ester as can be seen in Samples 7 and 9 in Table 4. The complex ester in Sample 7, comprised of HPHP and BEPD, has a pour point of -54°C. The complex ester in Sample 9, comprised of HPHP and NPG, has a pour point of -63°C. Samples 7 and 9 illustrate that the pour point for the HPHP complex esters of Sample 4 is lowered by 3°C when the molar proportion of BEPD ester is 40% and by 12°C when the molar proportion of NPG ester is 40 mol% of the polyol ester mixture. Similar results can be observed when comparing solubility characteristics. The solubility of the Sample 4 HPHP ester in R134a at -30°C is "good", whereas the solubility of the mixed ester of HPHP and NPG in Sample 9 is "excellent".

Applicants have also found that the viscosity of the present esters can be adjusted by suitably selecting the esterifying carboxylic acid component of the complex esters. By feeding a dibasic carboxylic acid into the esterification reaction and, in particular, by using it together with linear or branched acids, the viscosity of the product can be increased without impacting the cold and solubility properties of the product. Particularly preferred HPHP complex esters, therefore, contain some 1 to 10 mol-% dibasic carboxylic acid and 90 to 99 mol-% linear and/or branched monobasic carboxylic acid, and complex esters of HPHP and other polyol esters contain about 4 to 30 mol-% dibasic carboxylic acid and 96 to 70 mol-% linear and/or branched monobasic carboxylic acid. - The impact of the dibasic acid can be seen in the comparison of the esters in Tables 1 and 2 on page 8-9 of the Specification with those in Tables 3 and 4 on pages 10-11 of the Specification. There is no teaching or other indication in Nakahara that compositions with these improved

characteristics could be obtained by mixing HPHP esters with other polyol esters."

The Examiner did not accept our argument that the data in the Specification demonstrated the superiority of the claimed compositions and stated that Applicant had failed to compare the claimed compositions to the closest art of record (i.e. Example 10 of Nakahara). Applicant submits that the data presented in the Specification represents a closer comparison with the closest prior art than a comparison with the Nakahara reference. Nakahara discloses a multi-step process, whereas the results of Tables 1 and 2 have been obtained by the present invention. Applicant, therefore, believes that a comparison of the esters in Tables 1 and 2 with those in Tables 3 and 4 demonstrates the superiority of the claimed compositions. Reconsideration and removal of the rejection is respectfully requested.

Accordingly, in view of the above amendments and remarks, reconsideration of the rejections and allowance of the claims of the present application are respectfully requested. In the event that the Amendment does not place the present application into condition for allowance, entry thereof is respectfully requested as placing the present application into better condition for appeal.

In the event there are any additional matters remaining in this application, the Examiner is strongly encouraged to contact the undersigned at (714) 708-8555 in order to discuss these matters.

Pursuant to the provisions of 37 C.F.R. § 1.17 and 1.136(a), the Applicants petitioned for an extension of three months to February 23, 2002 for the period in which to file a response to the Office Action dated August 23, 2001 in the concurrently filed Notice of Appeal. The required fee has been paid in connection with the proper filing of this Notice of Appeal.

If necessary, the Commissioner is hereby authorized in this, concurrent, and further replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope to: Commissioner of Patents and Trademarks, Washington

D.C. 20231 on: Feb. 25, 2002
(Date of deposit)

BIRCH, STEWART, KOLASCH & BIRCH, LLP

Kalpana Reddy

(Signature)

02/25/02

(Date of Signature)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1-9, 16 and 18 have been canceled.

The claims have been amended as follows:

17. (Amended) Refrigerant composition comprising a chlorine-free hydrofluorocarbon based refrigerant and, mixed therewith, a lubricant containing a polyol ester, wherein said polyol ester is prepared in situ and comprises a mixture of 3-hydroxy-2,2-dimethyl-propyl-3-hydroxy-2,2-dimethyl-propionate (HPHP) and

- an ester of trimethylol propane, trimethylol ethane, pentaerythritol or 2,2,4-trimethylpentadiol, the amount of the 3-hydroxy-2,2-dimethyl-propyl-3-hydroxy-2,2-dimethylpropionate being at least 50 mol-% of the polyol residue of the ester mixture, or
- an ester of 2-butyl-2-ethyl-1,3-propanediol, the molar ratio of the 2-butyl-2-ethyl-1,3-propanediol ester and the 3-hydroxy-2,2-dimethyl-propyl-3-hydroxy-2,2-dimethylpropionate being 5:95 - 99:1.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Please replace the last paragraph on page 1, lines 30-36 with the following:

--The present invention is based on the finding that polyol or complex esters of 3-hydroxy-2,2 [methyl] dimethyl propyl-3-hydroxy-2,2-dimethylpropionate, i.e. hydroxypivalyl hydroxypivalate, which have good lubricant properties, also exhibit a good or excellent solubility in fluorinated refrigerants and they are therefore suitable for use in refrigerant compositions containing this kind of refrigerants. In particular the polyol esters used comprise the polyol PHPH (hydroxypivalyl hydroxypivalate) as such or together with another polyol, such as NPG, BEPD, ETHD, TMP, TME or PE and the carboxylic acid is a linear or branched C₅-C₁₈"--